

Technology Innovation Project



Project Brief

TIP 23: EPRI Program 35 – Overhead Transmission

Context

Transmission companies are focused on improving safety and reliability, while looking for ways to reduce operations and maintenance costs. Increasing transmission capacity without making large capital investments and reducing capital expenditures for new/refurbished equipment are major priorities. BPA is partnering with the Electric Power Research Institute (EPRI) to address these needs.

This project is an organizational effort to better coordinate BPA/EPRI research activities for increased efficiency and productivity. Membership association with EPRI allows BPA to go far beyond what BPA's own facilities could provide in terms of duration and extremity of testing and subject matter considered. For Program 35 (Transmission Lines) the strategy for EPRI involvement is to promote R&D through EPRI program projects and supplemental projects that are directly applicable to BPA's business lines and agency obligations. Pure knowledge from data gathered is, of course, gained through this affiliation; but the primary focus is on finding and promoting EPRI projects that directly apply to bulk power transmission owners like BPA. BPA project managers are selected based on their expertise in a particular area as well as the relevance of that subject to BPA's needs, and are expected to facilitate the involvement of other Subject Matter Experts (SMEs) in projects that can produce a demonstrable return on BPA investment.

This is a programmatic effort to formalize BPA's collaboration with EPRI so that the engagement is less arbitrary and more focused, with careful attention to a project's value added.

Description

The Electric Power Research Institute's Program 35, *Overhead Transmission*, addresses research needs of transmission asset owners. It includes projects focused on specific components (e.g., insulators, compression connectors and cross arms) as well as projects focused on transmission-related issues (e.g., lightning and grounding, live working and transmission capacity). It delivers a blend of short-term tools such as software, reference books and field guides, together with longer-term research, such as component aging tests and the development of sensors for monitoring line components and performance. The

program consists of multiple projects that are added or concluded during each program year.

This program also performs long-term laboratory experiments aimed at better understanding the aging and failure mechanisms of structures and line components. Corrosion laboratories create environments to better understand the impact of corrosion above and below ground; insulators are tested for aging and degradation to learn more about their long-term performance characteristics.

Why It Matters

Overhead transmission is a major area of responsibility for meeting BPA's strategic objectives. This program encompasses and addresses the technology needs described in the Transmission Technology Roadmap. BPA's continued participation assures the agency's representation in this program's governing body. Collaboration with other EPRI member utilities affords opportunities to leverage agency interest, share information and, in particular, avoid the very high costs associated with independently conducting this research. BPA's membership in this program includes access to EPRI's laboratories and testing facilities.

Goals and Objectives

BPA's participation will add the results of current EPRI R&D projects to Transmission Engineering design and analyses practices and provide BPA's contribution to EPRI member utilities in the following areas:

- Foundation analysis and design practices at BPA
- Conductor compression fittings and other advanced conductor work at BPA
- BPA's subgrade corrosion management practices
- BPA practices and techniques for live working
- BPA's work with polymer insulators and other composite components
- Lightning performance and analyses on BPA transmission lines and structures

The BPA project manager will continue reporting program status to management and the Collaborative Working Group. Continuing attention is being given to more accurately correlating individual project values with BPA needs.

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Project Start Date: January 1, 2009

Project End Date: December 31, 2016

Reports & References

Current Project Sets:

P35.001 - Overhead Transmission Line Inspection and Assessment Methods Guideline

P35.002 - Conductor, Shield Wire and Hardware Corrosion Management

P35.003 - Sub-Grade Corrosion Management of Transmission Line Structures

P35.004 - Compression Connector Management

P35.005 - Crossarm Management

P35.006 - Lightning Performance of Transmission Lines and Surge Arresters

P35.007 - Transmission Line Design Tools

Links

EPRI reports are available to BPA employees here:

<http://internal.bpa.gov/Services/Library/Pages/Databases.aspx>

Further information on EPRI Program 35:

http://mydocs.epri.com/docs/Portfolio/PDF/2010_P035.pdf

Participating Organizations

Ameren Services Co.
American Electric Power Service Corp.
American Transmission Co.
Arkansas Electric Cooperative Corp.
BC Hydro
Bonneville Power Administration (BPA)
CenterPoint Energy
Houston Electric, LLC
Central Hudson Gas & Electric Corp.
Consolidated Edison, Inc.
CPS Energy
Dominion Resources, Inc.
Duke Energy Corp.
Entergy Services, Inc.
ESKOM
Exelon Corporation
FirstEnergy Corp.

Georgia Transmission Corp.
Great Plains Energy Services, Inc.
Great River Energy
Hawaiian Electric Co., Inc
Hetch Hetchy Water & Power
Hoosier Energy Rural Electric Coop., Inc.
Hydro One Networks, Inc.
Korea Electric Power Corp.
Lincoln Electric System
Long Island Power Authority
Los Angeles Dept. of Water & Power
Manitoba Hydro
National Grid UK, Ltd.
Nebraska Public Power District
New York Power Authority
Northeast Utilities
NorthWestern Corp.

Pinnacle West Capital Corporation
PNM Resources, Inc.
PowerLink Queensland
PowerSouth Energy Cooperative
PPL Corporation
Salt River Project San Diego Gas & Electric Co.
Sarawak Energy Berhad
South Carolina Electric & Gas Co.
Southern Company
Tennessee Valley Authority (TVA)
The United Illuminating Company
Tri-State Generation & Transmission Association, Inc.
Unisource Energy Corporation
Western Area Power Administration
Xcel Energy Services, Inc.

Funding

Total Project Cost:	\$8,340,414
BPA Share:	\$433,202
External Share:	\$7,907,212
BPA FY2013 Budget:	\$433,202

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